

NAME:

DATE:

Unit-2 Mastery Assessment (version 633)

Question 1 (10 points)

Let f represent a function. If $f[9] = 22$, then there exists a knowable solution to the equation below.

$$y = \frac{f\left[\frac{x-21}{3}\right]}{2} - 5$$

Find the solution.

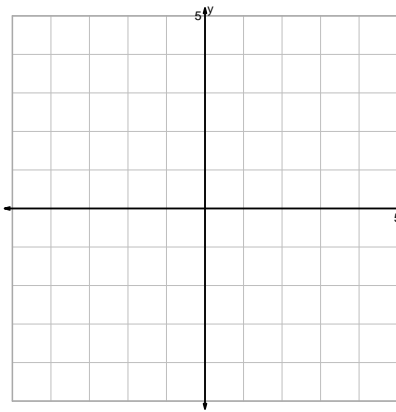
$$x =$$

$$y =$$

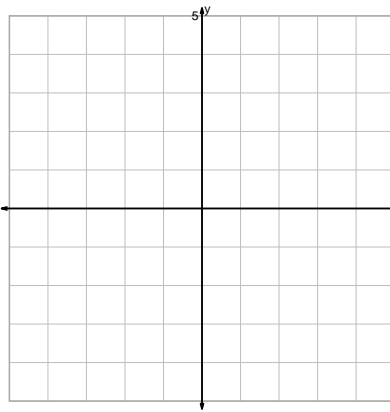
Question 2 (20 points)

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.

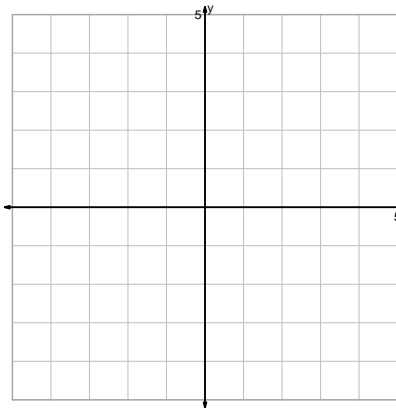
$$y = \sqrt{x} + 2$$



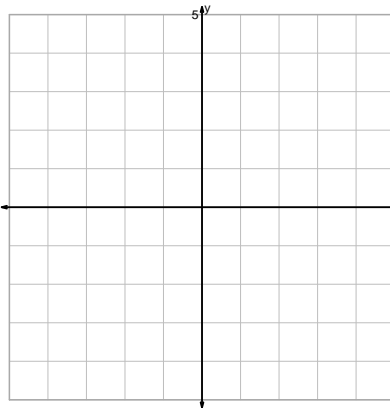
$$y = 2^x - 2$$



$$y = (x + 2)^3$$

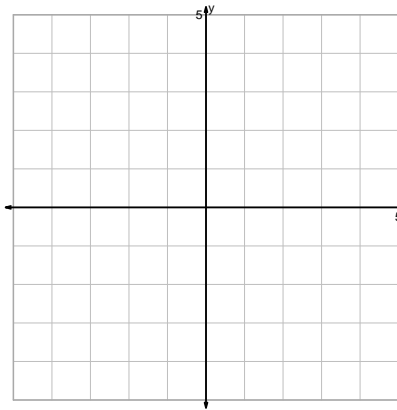


$$y = \sqrt[3]{\frac{x}{2}}$$

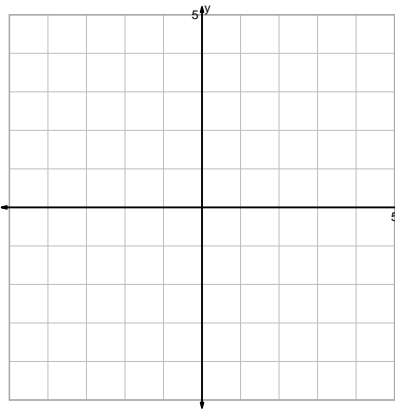


Question 2 continued...

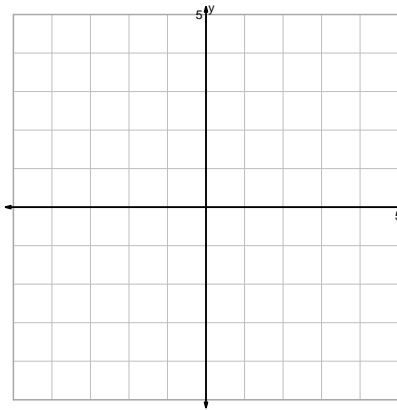
$$y = (x - 2)^3$$



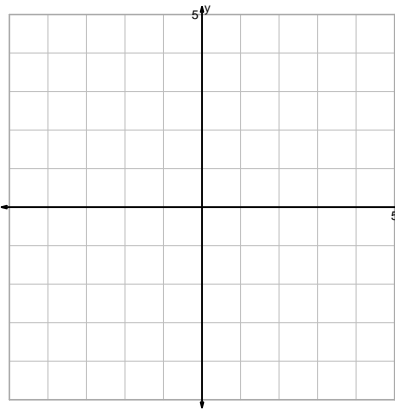
$$y = 2 \cdot \log_2(x)$$



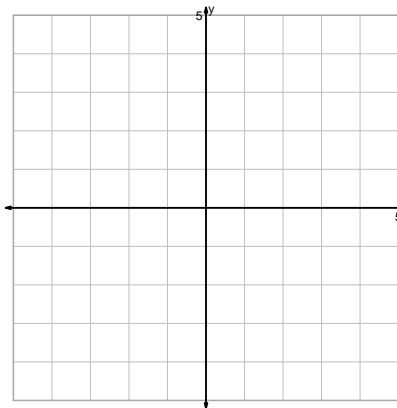
$$y = \frac{x^2}{2}$$



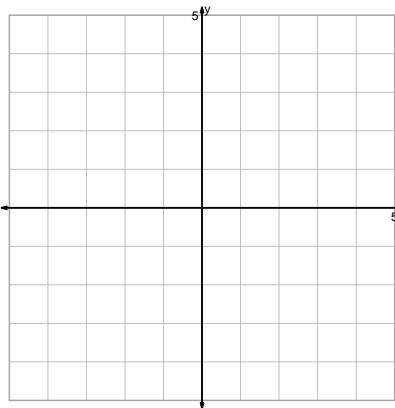
$$y = -\sqrt{x}$$



$$y = \log_2(-x)$$

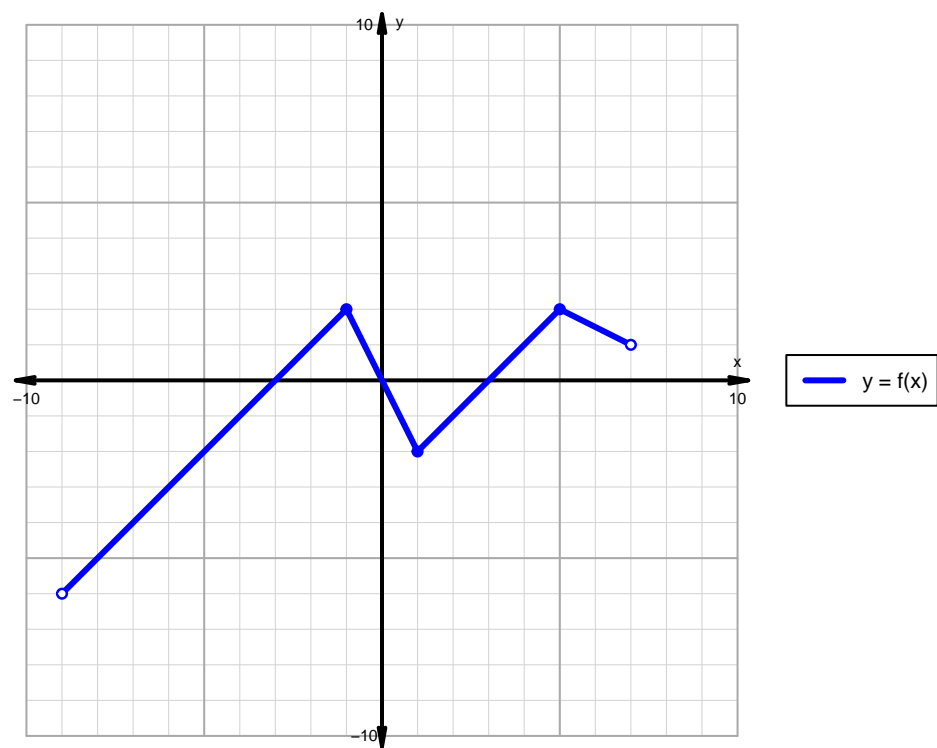


$$y = (2x)^2$$



Question 3 (20 points)

A function is graphed below.



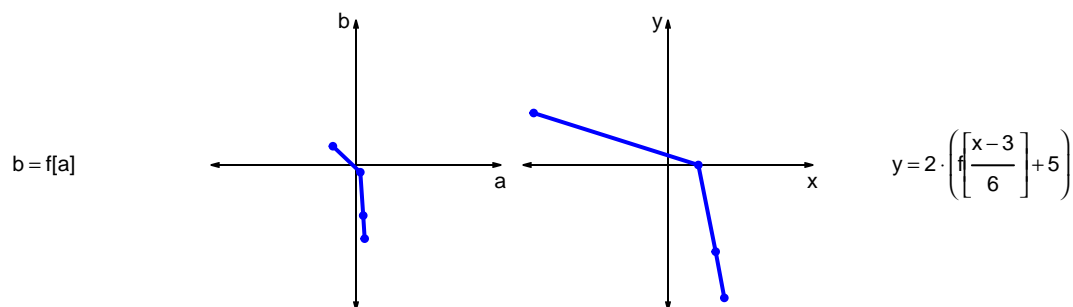
Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

Question 4 (20 points)

Let f represent a function. The curves $b = f[a]$ and $y = 2 \cdot \left(f\left[\frac{x-3}{6}\right] + 5\right)$ are represented below in a table and on graphs.

a	b	x	y
-16	13	-93	36
3	-5	21	0
5	-35	33	-60
6	-51	39	-92



- Write formulas for calculating x from a and calculating y from b . (Or, write the coordinate transformation formula.)
- What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve $y = f[x]$ into the second curve $y = 2 \cdot \left(f\left[\frac{x-3}{6}\right] + 5\right)$?

Question 5 (10 points)

A parent square-root function is transformed in the following ways:

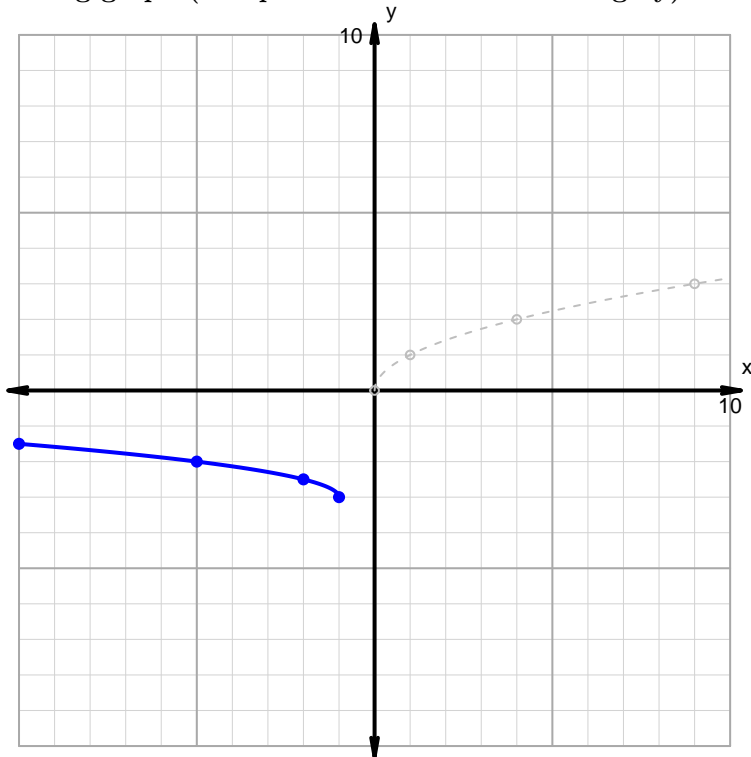
Horizontal transformations

1. Translate right by distance 1.
2. Horizontal reflection over y axis.

Vertical transformations

1. Vertical shrink by factor 2.
2. Translate down by distance 3.

Resulting graph (and parent function in dashed grey):

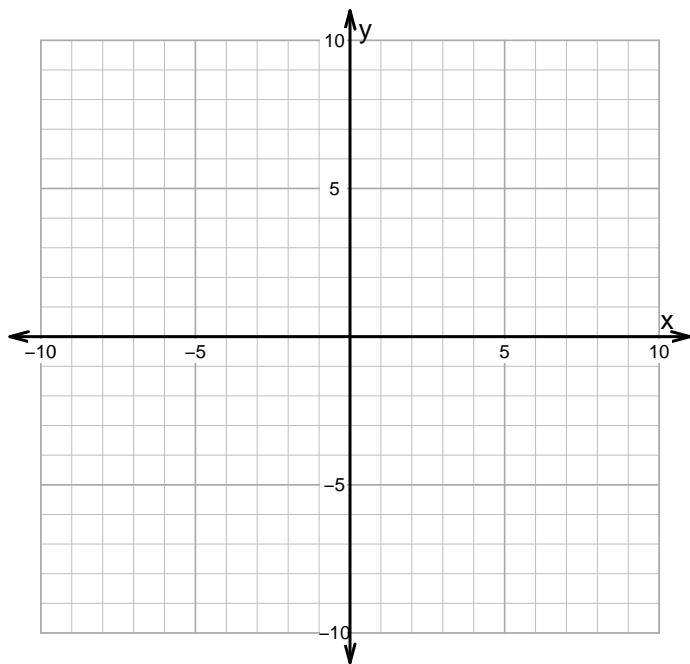


- What is the equation for the curve shown above?

Question 6 (20 points)

Make an accurate graph, and describe locations of features.

$$y = \frac{-1}{2} \cdot |x - 3| + 1$$



Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	